

ABSTRACT

Metal cold-working tooling and a method of employing such tooling. The tooling is used to produce deformation in a workpiece, to provide a selected beneficial residual stress profile in the workpiece, in order to provide high fatigue life structures in a minimum number of manufacturing steps. An indenter is used to coldwork a workpiece, causing dimples in the workpiece. Preferably, the dimples are provided with a shape formed by application of a uniform pressure profile to the workpiece surface. As optimized, a relatively uniform beneficial residual stress profile is provided at both the surface and at the midplane apertures in a workpiece, so as to improve overall fatigue life. Also, an improved indenter tool profile shape is described, having a smoothly curved indenter surface portion. And, the use of consumable lamina wafers provides the benefit of easy application of uniform stress profile to a workpiece.